

Body Part Nouns in Expressions of Location in French

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Abstract

In relation to inanimates, nouns that normally denote body parts when constructed in relation to an animate whole (*pied* ‘foot’, *tête* ‘head’, etc.) lose their literal meaning in French and acquire instead a spatial interpretation. This paper argues that *spatial* part Ns in French divide into two coherent groups with distinct properties: *fixed spatial part* terms, which denote concrete, perceptible objects and whose interpretation is completely predictable on the basis of the shape and position of the whole and *relative spatial part* terms, which denote a *location* projected from the whole. A detailed study of the two classes of expressions shows that, while the former are true nouns, the latter are in fact Axial Parts, a category motivated cross-linguistically in the semantic decomposition of prepositions.

1. Introduction

This paper argues that body part nouns in French (*pied* ‘foot’, *tête* ‘head’, *dos* ‘back’, *ventre* ‘belly’, etc.) can refer, productively, not only to partitions of the body, human or animal,¹ but also, as we will see, to spatial locations.

Body part nouns refer effectively to parts of the body when they are constructed in relation to a human or animal whole, i.e. when they are constructed with an animate complement:

- (1) le pied de Jean; le bras d’un enfant; le nez de l’homme;
 the foot of John the arm of a child the nose of the man
 la tête du chien; le dos d’un poisson; le flanc du cheval
 the head of the dog the back of a fish the flank of the horse

When constructed with inanimate complements, however, body part nouns lose their literal meaning and acquire instead a spatial interpretation. These are the cases that will interest us here. In their spatial use, as I will argue in what follows, they can potentially refer to two (distinct) types of spatial

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¹Parts of an animal body often have, in French, a different name than the equivalent human body parts (*gueule* for ‘mouth’ instead of *bouche*, *patte* for ‘leg’ instead of *jambe*, etc.). Except for *flanc* ‘flank’ and *queue* ‘tail’, no other animal body part nouns are used as expressions of spatial location in French.

locations. First, by analogy with the human body, they can name parts of an object that can be assimilated to the part the same noun would designate in relation to an animate object: e.g. *le pied de la lampe* (lit. the foot of the lamp) refers to the bottom part of the lamp which it stands on (i.e. its base). The use of body part nouns as nouns for spatial parts is well documented for French (see, for instance, Vandeloise 1986, Aunargue 1991, Borillo 1991). Further examples are given in (2):

- (2) a. le pied de la table
 the foot of the table
 ‘the leg of the table’
 b. le dos du livre
 the back of the book
 ‘the spine of the book’
 c. la tête du lit
 the head of the bed
 ‘the headboard of the bed’

The list of French body part Ns that can potentially function as spatial part nouns is given in (3) below:

- (3) pied; tête; queue; ventre; dos; corps; coude; coeur; front; cul;
 foot head tail belly back body elbow heart forehead ass
 dent; nez; bouche; doigt; flanc
 tooth nose mouth finger flank

In what follows we will see that in this use spatial part nouns are very similar to the literal body part expressions: their interpretation is fixed in the part-whole relationship and is completely predictable on the basis of the shape and position of the whole (see also Vandeloise 1986); their meaning is extremely restricted; and they denote concrete, perceptible, independent objects.²

In addition to fixed spatial parts, body part nouns can also express another (distinct) type of location. Among the nouns in (3), some, but not all, can also function, I will argue, as relative spatial terms. In this case, they no longer designate a fixed part of an object (body part or spatial part), but instead a location projected from a part of the whole and relative to the whole. More specifically, in this case *pied* ‘foot’, for instance, no longer refers to the lower section of a standing whole-object, but to the area of ground at the bottom of the object. Contrary to fixed spatial part nouns, they necessarily require the existence of a whole from which the space they

²In all their uses, body part nouns are inherently relational. However, when they are used as body parts (*le pied de Jean* ‘the foot of John’) or as fixed spatial parts (*le pied de la lampe* (lit. the foot of the lamp) ‘the lamp-base’), they can denote perceptible objects independently of whether there exists in actuality a whole they are a part of (e.g. *un pied de lampe* ‘a lamp base’ does not require the existence of an actual lamp). This is not true of other spatial uses of body part nouns, as we will see in more detail below.

denote is projected.

As will become clear in the discussion, the contrast between *fixed* and *relative* spatial part nouns is not simply a semantic contrast. I will show that the two classes of nouns have very different syntactic properties as well, supporting the idea that relative spatial part nouns constitute a special class distinct from regular nouns. Their particular distribution and syntactic behavior, as it will turn out, provide ground to the idea that they are in actuality Axial Parts (borrowing a terminology proposed by Svenonius 2006) rather than Ns. Concretely, this means that they should be assimilated to the apparently nominal heads in complex prepositions of the type *à côté de* (lit. at side of) ‘beside’ or in English *in front of*. If this is true, then, French presents an interesting case of Axial Parts as heads of DPs.

2. Fixed versus relative spatial part nouns

The distinction between fixed and relative spatial part nouns is, first of all, a semantic distinction, and is clearly observable in the examples (4)-(7) below. For each example, the (a) situation gives the *fixed* spatial part N reading, and the (b) situation the *relative* one:

- (4) Le nez de l’avion est à l’ombre.
the nose of the.plane is in the.shade
 - a. fixed spatial part N:
the front part of the plane is in the shade, the rest is in the sun.
 - b. relative spatial part N:
all the plane is in the sun, however the position of the sun is such that there is shade under the front part of the plane (only).
- (5) La tête du lit est encore humide.
the head of.the bed is still wet
 - a. fixed spatial part N:
the headboard is still wet (after washing it).
 - b. relative spatial part N:
the floor under and around the section of the bed touching the wall is still wet (the rest already dried, for instance).
- (6) Le dos de la grange est en béton.
the back of the barn is in concrete
 - a. fixed spatial part N:
the back wall is made of concrete.
 - b. relative spatial part N:
the area of ground in the back of the barn is paved with concrete.

- (7) Le pied de la tour est couvert de mousse.
the foot of the tower is covered of moss
- a. fixed spatial part N:³
 the bottom section of the tower is moss-covered.
 - b. relative spatial part N:
 the area of ground at the bottom of the tower is covered by moss.

In the two cases the part nouns refer to completely different entities: in one case it is a concrete and perceptible object (a), whereas in the other it is a projected space (b).

Under the (a) interpretation, the nouns *nez* ‘nose’, *tête* ‘head’, *dos* ‘back’ and *pied* ‘foot’ refer to fixed parts in the part-whole relationship that are independent of the actual position of the whole and of the existence of an actual perceptible whole altogether. First, *le pied de la lampe* (lit. the foot of the lamp) ‘the lamp-base’, for instance, denotes the same portion of a lamp, no matter how the lamp is placed (whether standing, lying on the floor, etc.); and therefore remains fixed in all contexts.

Second, *pied* can denote a part that does not enter in a relationship with an existing whole but instead with a certain expectation of a whole. Specifically, *un pied de lampe* (lit. a foot of lamp) ‘a lamp-base’ can refer to an object expected to be the bottom part of a lamp, even in contexts where there is no actual whole lamp. Note that *pied* in *pied de lampe* is, nevertheless, even more relational than *pied* as a body part N, as, while we can refer to a (human) foot as *un pied* (without an overt complement), the spatial part *pied* must always be accompanied by its complement: i.e. *pied de lampe* and not *pied*.

Without exception, all body part Ns that can potentially be used as expressions of location can refer to fixed spatial parts of an object; additional examples are given in (8):

- (8) le ventre de la ville; la queue du train;
the belly of the city the tail of the train
 ‘the center of the city’ ‘the rear part of the train’
- le coude du tuyau; la bouche du métro;
the elbow of the pipe the mouth of the subway
 ‘the bend of the pipe’ ‘the entrance of the subway’
- le doigt de l’engrenage; le cul de la bouteille; etc.
the finger of the gear the ass of the bottle
 ‘the tooth of the gear’ ‘the bottom of the bottle’

³Speaker variation is attested here. Some speakers seem to allow a fixed interpretation for *pied* in restricted cases only, i.e. when the base part of the whole is clearly distinguishable in shape, color, material, etc. from the rest. Other speakers, myself included, allow the fixed reading with any vertical object (standing by itself, presumably).

In their fixed interpretation, spatial part Ns have a very restricted meaning and exhibit very strict selection restrictions on their complement. To illustrate this point, note that *pied* ‘foot’, for instance, cannot refer to the bottom section of anything, but is restricted to standing objects resting on an independent lower section: e.g. tables (‘table-leg’), beds (‘footboard’), glasses (‘base’), lamps (‘base’), statues (‘base’), cameras (‘tripod’), walls, towers, buildings (but see footnote 3), etc. Similarly, both *nez* ‘nose’ and *tête* ‘head’ refer to the front part of an object. The former, however, is restricted to vehicles whose front part resembles a pointing nose; i.e. cars, spaceships, tractors, planes, but only marginally bicycles, motorcycles, and not carriages, trailers, etc. The latter has a completely unrelated use, as it is restricted to (moving) objects that have roughly speaking the shape of a snake: trains, parades, marathons, corteges, processions, marching bands, etc. Likewise, *bouche* ‘mouth’ only applies to openings that allow something or someone to go towards the exterior or interior of a “tube” (in a broad sense): subway (‘entrance’; ‘exit’), air conditioning (‘spout’), sewer (‘drain trap’), guns (‘muzzle’), etc.

Let us turn now to the (b) reading, where the spatial part N denotes not a fixed part of a whole, but instead a space projected from a part of the whole. The part noun refers, in this case, to areas of ground instead of discrete objects. This reading is *relative*, because, first, it presupposes the existence of a perceptible whole and, second, it can vary relatively to the position of the whole object.⁴ In the (b) cases in (4)-(7), there must be an actual whole ground object in order for the relative reading to arise. Concretely, *le nez de l’avion* ‘the nose of the plane’ can denote the area of ground under the front part of the plane only if there is, in actuality, a plane. Note also that depending on the position of the plane the area of ground denoted by *le nez* ‘the nose’ does not remain necessarily the same. These two properties of relative spatial part Ns contrast clearly with those of fixed ones.

There is an evident meaning relationship, however, between the relative part noun and its related fixed noun, which appears clearly once we consider their respective selection restrictions on their complement. Any relative part noun is only compatible with a whole if the latter is also compatible with the related fixed noun. Thus, specifically, relative part *pied* is allowed with a whole object that has a fixed part *pied*. In the pair in (9), *pied* is allowed with a building, which has a fixed lower section that can also be referred to as a *pied*, while it is not allowed with *window*, which, although it is a vertical standing object, does not typically have a lower section referred to as a *pied*:

⁴This presupposes an *intrinsic* frame of reference (Levinson 1996). It can presumably also vary according to the position of the speaker in a *relative* frame of reference. I will disregard the distinction here.

- (9) a. Le pied de l'immeuble est couvert de déchets.
 the foot of the building is covered of waste
 'The bottom of the building is covered by waste'
 b. #Le pied de la fenêtre est couvert de déchets.
 the foot of the window is covered of waste

This suggests that the space projected from the whole by the relative spatial part N is projected precisely from the fixed spatial part of the whole the fixed noun refers to.

Regarding the distribution of relative spatial part Ns, it is important to notice that their use is much more restricted than the fixed ones. Among the body part nouns that can potentially express spatial locations and which are listed in (3) above, only the very limited sub-class given in (4)-(7)(b) allows the relative interpretation: *pied* 'foot', *tête* 'head', *dos* 'back' and *nez* 'nose'. All others only have a fixed spatial part meaning. In view of the limited number of body part nouns that can function as relative spatial parts, I propose that they must, in fact, be listed as relative spatial part items in the Lexicon, rather than derived (in whichever way) from the fixed ones. The four terms *pied*, *tête*, *dos* and *nez* constitute a class of relative spatial part items, which happen to be homophonous with the related fixed part Ns.⁵

One clear way to distinguish the two forms, in cases of homophony, is that only fixed spatial part terms can serve as a head in compound structures of the type (*spatial*) *N – de – N*, typical of compound formations in French, where the complement of *de* 'of' is a bare N, as in (10). The examples in (10) can only refer to fixed spatial parts, and not to relative locations (compare in particular (10d) with (5) above):

- (10) a. On ne peut pas retrouver un nez d'avion après un tel
 one NEG can not find a nose of.plane after a such
 choc.
 crash
 'A plane front part could never be found after such a crash'
 b. Le pied de table doit être repeint.
 the foot of table must be repainted
 'The table-leg must be repainted'
 c. La tête de missile s'est perdue en mer.
 the head of missile RFLX.is lost in sea
 'The missile-head was lost at sea'
 d. La tête de lit est encore humide.
 the head of bed is still wet
 'The headboard is still wet'

⁵Nouns that can function as relative spatial terms are not exclusively body part expressions in French, but include also other spatial nouns (see, in particular, examples (39)-(40), below). If not as restricted as would appear from the discussion above, the list of relative spatial part nouns remains, nevertheless, very limited.

The apparent difficulty of forming compounds in cases such as *#un pied de tour* (lit. a foot of tower) or *#une tête de défilé* (lit. a head of parade) comes presumably only from the fact that it is more difficult to regard those as objects independent of their whole. Notice, however, that this problem can easily be overcome in the appropriate context:

- (11) Ton reportage est intéressant, mais tu n'as pas filmé
your documentary is interesting, but you NEG.have not shoot
 la tête de défilé.
the head of parade
 'Your documentary is interesting, but you didn't shoot the front
 section of the parade'

That only *fixed* spatial part nouns can be the head of a nominal compound seems to indicate that *fixed* and *relative* terms have a different status syntactically, making fixed spatial terms only behave like regular nouns. In what follows, we will see that this is precisely the case; and that the peculiar distribution and syntactic behavior of *relative* spatial part nouns forces us to assimilate them to other location terms that are apparently nominal but lack as well most of the regular properties of nouns.

3. Contrastive properties of *fixed* and *relative* spatial part nouns

In most of their occurrences, spatial part nouns (whether *fixed* or *relative*) appear with a definite complement (introduced by the preposition *de* 'of') (cf. examples (2), (4)-(7), and (8) above). Except for the fact that only fixed nouns can also take a bare complement (see above), on the surface at least forms such as *pied* 'foot', *nez* 'nose', *dos* 'back' and *tête* 'head', which can be either relative or fixed spatial part Ns, are not easily distinguishable. I will argue, however, that both nouns have very different properties, and that their differences are compelling enough to treat them as different classes of nouns.

3.1. Plural

The first contrast between fixed and relative spatial part nouns is that only the former can take plurals. Fixed spatial part nouns can be pluralized in two contexts: as plurals of the parts and with pluralities of the wholes. In the first case, they can be plural when they denote more than one part of the same whole object. A typical example would be *pied* in relation to a table, for instance, which has more than one leg. In this case, the part noun *pied*, as expected, appears in the plural; see examples in (12):

- (12) les pieds de la table; les coudes de la rivière;
the feet of the table the elbows of the river
 'the legs of the table' 'the bends of the river'

les dents de la scie; les doigts de l'engrenage; etc.
the teeth of the saw the fingers of the gear
 'the teeth of the saw' 'the teeth of the gear'

The other case where fixed spatial part nouns pluralize is when they take a plural complement, i.e. with plurality of the whole. In this case, the plural is in fact obligatory, as illustrated in (13), unless the head noun is interpreted generically, in which case, similarly to other occurrences of the definite article as generic, they can remain singular (14):

- (13) a. Les pieds des tables sont cassés.
 the feet of.the tables are broken
 'The legs of the tables are broken'
- b. Les nez des avions doivent être déneigés.
 the noses of.the planes must be cleared.of.snow
 'The noses [i.e. front parts] of the planes must be cleared of snow'
- c. Les flancs des montagnes sont verdoyants.
 the flanks of.the mountains are verdant
 'The sides of the mountains are verdant'
- (14) a. Dans le style Louis XV, le pied des tables est
 in the style Louis XV, the foot of.the tables is
 épuré.
 uncluttered
 'In Louis XV style, table legs are uncluttered'
- b. Le nez des avions est bleu chez Air Tahiti.
 the nose of.the planes is blue at Air Tahiti
 'For Air Tahiti, the nose of the planes is blue'
- c. Le flanc des montagnes est plus verdoyant vers le
 the flank of.the mountains is more verdant towards the
 sud qu'au nord.
 south than.in.the north
 'The mountains' sides are more verdant in the south than in the north'

By contrast, relative spatial part Ns are never compatible with the plural under any of the contexts discussed above. First, they are never found in the plural in relation to a singular whole; this suggests that there exists only one relevant relative part (as denoted by the spatial part N) for any given whole. Specifically, *pied*, for instance, under a relative interpretation must denote a single space projected at the bottom of the whole object (even though conceptually, at least, we could imagine in some cases a building having more than one bottom area according to different criteria such as

the position of the speaker for instance).⁶

- (15) *les pieds de l'immeuble; *les dos de la grange; *les nez de
the feet of the building the backs of the barn the noses of
 l'avion
the plane

Second, relative spatial part Ns cannot be pluralized even when they are constructed with pluralities of the wholes, in contrast with the cases in (13) above. Instead, relative spatial part nouns must remain in the singular:

- (16) *les pieds des immeubles; *les dos des granges; *les nez
the feet of the buildings the backs of the barns the noses
 des avions
of the planes
- (17) le pied des immeubles; le dos des granges; le nez
the foot of the buildings the back of the barns the nose
 des avions
of the planes

Contrary to (14) above, the singular in (17) is not interpreted as generic, but instead as a singular of the part distributing over the pluralities of the wholes. Supporting this contrast, note that while the sentences in (14) are compatible with adverbs of generic quantification, those in (17) are not (without a radical change in meaning): *Le nez des avions est généralement bleu chez Air Tahiti* 'The front part of the planes [lit. the nose of the planes] is generally blue for Air Tahiti' versus **Le nez des avions est généralement à l'ombre* 'The bottom area under the planes [lit. the nose of the planes] is generally shady'.

Classes of nouns that are known to never take the plural are relatively few in French (and for that matter English). Across the board, plural being associated to countability, nouns that do not have plural forms are non-countable. Two classes are commonly distinguished: mass terms (cf. **des airs* 'airs' or in English **waters*, **golds*, **furnitures*) and (at least some) abstract terms (**des chaos* 'chaoses' or in English **knowledges*, **kindnesses*, **informations*). Considering this point in conjunction with the fact that fixed spatial part nouns denote concrete, perceptible objects independent of their whole, while relative part nouns do not, one could conclude that the former are concrete countable terms, while the latter are abstract non-countable ones. In sum, this would mean that relative and fixed spatial part nouns are necessarily two different classes of nouns, as already hinted at in the discussion of nominal compound formation above. An alternative view would be that relative spatial part items are not nouns, and that although

⁶The ungrammaticality judgment in (15) concerns *relative* spatial part nouns only. There is a reading of (15) where the noun *pied* is fixed instead of relative, as already discussed above.

they exhibit at least in the surface some properties of nominals, they form a completely different class of word altogether. As we will see, evidence in French will favor the second view over the first one.

3.2. Determiners

Further differences between relative and fixed spatial terms are found in the context of determiners. As we will see below, fixed part nouns exhibit the expected behavior of typical nouns in being able to combine with the whole range of determiners (definite and indefinite articles, quantifiers, possessives). Relative part nouns, however, are much more restricted, and allow, as it will turn out, only one determiner, namely the definite article. We know from the discussion above that relative part nouns cannot pluralize; this means that relative part nouns can combine with one article only: the definite singular.

Relative spatial part nouns are found productively with the definite (singular) article *le*, *la* in French (see (4)-(7) above). They cannot, in particular, combine with the indefinite article (18). Indefiniteness, if expressed, must be marked on the noun complement (indefiniteness of the whole), while the part noun remains definite (19):

- (18) *Un pied d'un immeuble a été nettoyé.
 a foot of.a building has been cleaned
- (19) Le pied d'un immeuble a été nettoyé.
 the foot of.a building has been cleaned
 'The bottom of a building has been cleaned up'

They cannot combine with any quantifiers or demonstratives either. Similarly to the situation in (18)-(19), quantifiers and demonstratives can only be found on the noun complement, and modify the whole rather than its relative part:

- (20) a. *ce pied de l'immeuble
 this foot of the.building
 b. le pied de cet immeuble
 the foot of this building
- (21) a. *chaque pied de l'immeuble (/des immeubles)
 every foot of the.building (/of.the buildings)
 b. le pied de chaque immeuble
 the foot of every building
- (22) a. *aucun pied de l'immeuble (/des immeubles)
 no foot of the.building (/of.the buildings)
 b. le pied d'aucun immeuble
 the foot of.no building

Fixed spatial part nouns, in contrast, allow both the definite article (cf. for instance (4)-(7) above) and the indefinite article (see (10a) above). The latter is found most productively with nominal compounds discussed earlier, see (23a), as well as, at times, with a definite complement, as in (23b) (contexts where the partitive is also possible: *un des pieds de la table* ‘one of the legs of the table’ (lit. one of the feet of the table)). They also freely allow demonstratives (24), and quantifiers (25)-(26) setting a clear contrast with relative nouns in (18)-(21):

- (23) a. un pied de lit; un nez de voiture; un dos de cuillère;
 a foot of bed a nose of car a back of spoon
 une bouche d’égout
 a mouth of.sewer
 b. un pied du lit; une bouche du métro
 a foot of.the bed a mouth of.the subway
- (24) a. ce pied de lit; ce nez de voiture; ce dos de cuillère;
 this foot of bed this nose of car this back of spoon
 cette bouche d’égout
 this mouth of.sewer
 b. ce pied du lit; cette bouche du métro
 this foot of.the bed this mouth of.the subway
- (25) a. chaque pied de lit; chaque nez de voiture; chaque dos de
 every foot of bed every nose of car every back of
 cuillère; chaque bouche d’égout
 spoon every mouth of.sewer
 b. chaque pied du lit; chaque bouche du métro
 every foot of.the bed every mouth of.the subway
- (26) a. aucun pied de lit; aucun nez de voiture; aucun dos de
 no foot of bed no nose of car no back of
 cuillère; aucune bouche d’égout
 spoon no mouth of.sewer
 b. aucun pied du lit; aucune bouche du métro
 no foot of.the bed no mouth of.the subway

The fact that relative spatial part terms cannot combine with the indefinite article, quantifiers and demonstratives suggests, once again, that they are distinct from typical nouns and, in particular, from fixed spatial part nouns.

The distinction is further manifested in another context exhibiting a clear restriction on the type of determiner relative spatial terms can take, namely possessives. As expected, considering what we know of relative spatial parts so far, these terms cannot combine with a possessive, and require instead, once again, the definite (singular) article. In this respect, they differ again from fixed spatial part expressions. The contrast, exemplified in (27)-(28), shows that when constructed in an anaphoric relationship with

the whole object, fixed spatial part nouns must take the possessive (27). In this context, however, relative part terms do not take the possessive, and must, once again, take the definite article:⁷

- (27) Nous avons remplacé la statue sans jamais toucher son/??le
we have replaced the statue without never touch its/the
 pied.
foot
 ‘We replaced the statue without ever touching its base’
- (28) Nous avons parcouru la montagne sans jamais atteindre
we have strolled the mountain without never reach
 *son/le pied.
its/the foot
 ‘We strolled the mountain without ever reaching its bottom’

Interestingly, however, the definite article in (28) is (descriptively at least) not the same as the definite article in another context where body part nouns are found productively with the definite article in French, i.e. inalienable possession. In French, body part nouns when in relation to animate wholes can be used with the definite article to express possession (29). The apparent similarity between inanimate wholes in (28) and animate ones in (29) is contradicted by one crucial difference. While the definite article in constructions with relative spatial part nouns (e.g. *le pied de la montagne* lit. the foot of the mountain) entails uniqueness of the part (cf. section 3.1, in particular), the definite article in construction with body part nouns (of animate bodies, e.g. *le pied de l’enfant* ‘the foot of the child’) is associated with no such restriction. Specifically, with body part nouns, the singular definite article is compatible with parts that are ‘possessed’ by the whole in more than one specimen. In (29), the definite article is compatible with the speaker having two hands and two legs (a-b) and still having ten fingers (c) (as with the possessive in English):

- (29) a. Le petit garçon me tient par la main.
the little boy me holds by the hand
 ‘The little boy holds my hand’
- b. Je me suis cassée la jambe.
I myself am broke the leg
 ‘I broke my leg’
- c. J’ai mal au doigt.
I have pain at.the finger
 ‘My finger hurts’

⁷Borillo (1991) notices similar facts in the context of complex PPs of the type *au pied de* ‘at the bottom of’ (lit. at.the foot of) and *au sommet de* ‘at the top of’. It is clear here that the restrictions are also found in DPs, and not only in PPs. We will come back to the PPs in section 4.

While the definite singular article entails uniqueness with relative spatial part nouns, note that this is not true for all nouns denoting projected space either. For instance *côté* ‘side’, when constructed with the definite singular article, does not entail uniqueness of the part, and is compatible with a whole (in (30), a building, for instance) having more than one side:

- (30) J’ai nettoyé le côté de l’immeuble.
I.have cleaned the side of the.building
 ‘I cleaned up the side of the building’

The reason relative spatial part nouns differ, in this context, from other projected space denoting nouns is not clear at this point, especially considering the similarities they otherwise exhibit (see section 4, below), and I must leave this issue unresolved here.

3.3. Adjectival modification

Finally, further supporting the special status of *relative* spatial part terms, I note that they, contrary to regular nouns, are unable to receive adjectival modifiers. In a very systematic manner, the insertion of an adjective modifying the head part noun triggers a fixed part interpretation and blocks the relative part reading. Specifically, a spatial part N such as *dos* ‘back’, which is homophonous between a fixed and a relative part (as shown in (6) above, for instance), can only be a fixed part in (31) below: the reflection in the lake can only be that of a back wall, and not the area of ground in the back of the barn:

- (31) Le dos ensoleillé de la grange se réfléchissait dans l’étang.
the back sunlit of the barn RFLX reflected in the.pond
 ‘The sunny back of the barn was reflected on the pond’

Other examples show exactly the same thing:⁸

- (32) Le nez aspergé de l’avion est maintenant décontaminé.
the nose sprayed of the.plane is now decontaminated
 ‘The sprayed nose [i.e. front part] of the plane is now decontaminated’

⁸I found one example (cf. (i)), where the modified part N is evidently both a relative and a fixed part. In this case, however, the projected space interpretation seems to be coerced by the modifying adjective. Because *ombre* ‘shade/shadow’ typically denotes the projection of an object (shape) onto a given surface, *le dos ombragé* ‘the shady back’ seems to potentially denote the projection itself, and therefore an area of the ground (i.e. the surface of reflection):

- (i) Le dos ombragé de la grange ne se réfléchissait pas dans l’étang.
the back shady of the barn NEG RFLX reflected not in the.pond
 ‘The shady back of the barn was not reflected on the pond’

If this is true, the same could probably also be said of example (4) above. The existence of examples (5)–(7), however, is a clear indication that, for unmodified spatial part Ns, the relative interpretation is not always a coerced interpretation.

As expected, nouns that are fixed spatial part nouns can, by opposition, freely take adjectives (33), as well as, for instance, superlatives (34):

- (33) Le pied cassé de la table a été réparé.
the foot broken of the table has been repaired
 ‘The broken leg of the table has been repaired’
- (34) Nous allons passer le coude le plus dangereux de la rivière.
we go pass the elbow the most dangerous of the river
 ‘We are going to pass the most dangerous bend of the river’

In the context of adjectives, only fixed spatial part Ns exhibit the typical behavior of regular nouns. Relative part nouns are again special.

4. Relative spatial part expressions are Axial Parts

The properties of relative spatial part nouns make them differ in crucial ways from regular nouns: they can take one determiner only (namely, the definite singular), they cannot pluralize and they do not allow adjectival modification. Their status as nominals is at least questionable. The only indication that they are in fact nominals comes from their need to function with the definite article.

This, however, in no way constitutes a proof that they are effectively nouns, as French allows a large variety of categories to function as (apparent) nominals with an article. As is well-known, French allows the following expressions to appear with an article, in the absence of an overt noun (with, at times, idiomatic readings): adjectives (*le rouge* (lit. the red), *la belle* (lit. the handsome.fem), *les petits* (lit. the small.pl); see Borer and Roy 2005), adverbs (*l’ailleurs* (lit. the elsewhere), *le pourquoi* (lit. the why), *le peut-être* (lit. the maybe)), verbs (*le manger* (lit. the eat.inf), *le devenir* (lit. the become.inf), and also prepositions (*le pour* (lit. the for), *le contre* (lit. the against)).

As we will see below, relative spatial part nouns share (in fact) their properties with other spatial location expressions, specifically the apparent nominals found in complex prepositions as in (35). The so-called complex prepositions are formed, in French (as in many other languages) with a simple preposition (most commonly *à* ‘at/in’) combined with a noun, with or without an article.⁹ The head noun in (35) is referred to as an Axial Part (henceforth, *AxPart*) and in the semantic decomposition of prepositions determines the space projected from the Ground (Svenonius 2006):

⁹More rarely, complex prepositions in French can also be formed from an adjective (*au long de* ‘along’ (lit. at the long of)) or an adverb (*au delà de* ‘beyond’ (lit. at the beyond of)), introduced by an article. This seems to indicate that Axial Parts are not exclusively homophonous with nouns; a point that requires further investigation and in particular cross-linguistic investigation.

- (35) a. à l'intérieur de
at the interior of
 'inside'
 b. au fond de
at the depth of
 'at the bottom of'
 c. à côté de
at side of
 'beside'

The heads of these complex prepositions are almost systematically related to nominal equivalents in the DP system¹⁰, including in cases like (36a), which no longer have a nominal equivalent in referential uses (presumably because it has been lost diachronically) (see (36b)), except in idiomatic expressions (36c):

- (36) a. au travers de la route; autour de la cheville
at the traverse of the road at the tour of the ankle
 'across the road' 'around the ankle'
 b. *le travers (de la route); *le tour (de la cheville)
the traverse of the road the tour of the ankle
 c. un travers de porc; ton tour de tête
a traverse of pork your tour of head
 'pork ribs' 'your head size'

The properties of these apparent nominal heads, if not well understood, are at least well documented cross-linguistically (see, in particular, Pantcheva 2006 for Persian and Son 2006 for Korean). For French, I can point out at least three important properties that make them differ from regular nouns and pattern instead with our *relative* spatial part terms: adjectives, determiners and number.

First, AxParts in French (and also other languages as English, for instance) can never take adjectival modifiers. In (37), the insertion of an article modifying the (bare) head noun simply triggers ungrammaticality. In (38), where the head noun is introduced by the definite article, adjective insertion blocks the AxPart reading and triggers ungrammaticality as well. It leaves, however, the possibility of interpreting the head noun as a referential noun (in which case it would be constructed with a single preposition, which would have to be different from the one in (38): *dans le joli intérieur de* 'in the pretty home of' (lit. in the pretty interior of), *dans le fond obscur de* 'in the dark bottom of' (lit. in the dark depth of)):

- (37) a. *à grand côté de
at large side of

¹⁰See footnote 9, however.

- (38) b. *à long travers de
 at long traverse of
 a. *au joli intérieur de
 at.the pretty interior of
 b. *au fond obscur de
 at.the depth dark of

Second, they differ in two major ways from regular nouns with respect to their determination. AxParts can be bare, as in (35c) above, whereas French is known to never allow bare (argumental) nouns. The only occurrences of bare nouns in French are in predication contexts (specifically, in post-copular position, small clauses, etc.) and therefore never as DPs. In addition, AxParts, when they combine with an article, can take one form only: i.e. the definite article:

- (39) a. à {*un/ *chaque/ *aucun} intérieur de
 at a every no interior of
 b. à {*un/ *chaque/ *aucun} fond de
 at a every no depth of

Finally, they cannot be marked for number, and specifically cannot appear with plural marking. Again, the only interpretation for (40a,b), if any, is that of a real N introduced by a single preposition, and not an AxPart (although in this case again the preposition would presumably have to be different):

- (40) a. *aux intérieurs de
 at.the.pl interiors of
 b. *aux fonds de
 at.the.pl depths of
 c. *aux côtés de
 at.the.pl sides of

In sum, the properties of AxParts are evidently similar to the ones of our *relative* spatial part terms. The similarities between *relative* spatial part nouns in the DP system and AxParts in the functional projection of PPs are convincing enough to warrant a unified treatment, and suggest that the former (i.e. *relative* spatial part terms) are in actuality instances of the latter, i.e. they are AxParts.

Interestingly, the similarities between the two extend to their uses in PPs as well. For AxParts, we know that, in PPs, they exhibit very strict restrictions on the choice of the (simple) preposition they can combine with (usually one form is possible only, sometimes two). In additional support of the claim that *relative* spatial part nouns are in actuality AxParts, I find that in their occurrences in PPs, they also take a very limited set of prepositions (in most cases one only), as exemplified in (41)-(44) below:

BODY PART NOUNS IN EXPRESSIONS OF LOCATION IN FRENCH

- (41) a. au pied de la lampe
at.the foot of the lamp
 ‘at the bottom of the lamp’
 b. ??du pied de la lampe
from.the foot of the lamp
 ‘from the bottom of the lamp’
 c. { *dans le/ *sur le/ *contre le } pied de la lampe
in the on the against the foot of the lamp
- (42) a. à la tête du train
at the head of.the train
 ‘in the front section of the train’
 b. en tête de train
in head of train
 ‘in the front section of the train’¹¹
 c. { *de la/ *dans la/ *sur la/ *contre la } tête du train
from the in the on the against the head of.the train
- (43) a. au dos de la grange
at.the back of the barn
 ‘in the back of the barn’
 b. { *du/ *dans le/ *sur le/ *contre le } dos de la grange
from.the in the on the against the back of the barn
- (44) a. sous le nez de la voiture
under the nose of the car
 ‘under the front section of the car’
 b. { *au/ *du/ *sur le/ *contre le } nez de la voiture
at.the from.the on the against the nose of the car

Again, the examples marked with an asterisk above are possible, but only with a fixed spatial part reading for the head noun, i.e. precisely not the projected space interpretation, and therefore *not* as complex prepositions (but instead as a regular part noun introduced by a single preposition). In these cases, as expected, a compound form of the type *N-de-N* is allowed as well:

- (45) a. dans / sur / contre le pied de lampe
in on against the foot of lamp
 ‘in/on/against the lamp-base’

¹¹The preposition *à* ‘at/in’ followed by a feminine (definite) noun is often realized as *en* in French. Consider, as an illustration, the alternation, in the context of country names between the preposition *à*, which appears with the definite article only when it is masculine (and realized as the contraction *au* (lit. *à+the.masc*), vs. the preposition *en* found without an overt article in the case of feminine countries: *au Portugal* (in+the.masc Portugal.masc), *au Sénégal* (in+the.masc Senegal.masc), *au Canada* (in+the.masc Canada.masc), but *en Norvège* (in Norway.fem), *en France* (in France.fem), *en Italie* (in Italy.fem). It is thus plausible that examples (42a) and (42b) are simply variants of the same form.

- b. dans / sur / contre le dos de la grange
in on against the back of the barn
 in / on / against the back wall of the barn'
- c. dans / sur / contre la tête du train
in on against the head of the train
 'in / on / against the front coach of the train'
- d. au / du / sur le / contre le nez de la voiture
at the from the on the against the nose of the car
 'at / from / on / against the front part of car'

When constructed inside a PP, the semantic distinction between *relative* spatial part terms (which are AxParts) and *fixed* spatial part nouns is, again, very clear and mirrors the contrasts found in their DP uses: depending on whether they are true Ns or AxParts, spatial part terms refer to completely different places, i.e. fixed location (N) or projected space (AxPart):

- (46) a. Attache le ruban au pied_N de l'arbre.
tie the ribbon at the foot of the tree
 'Tie the ribbon to the bottom part of the tree' [i.e. the trunk]
- b. Les fleurs poussent au pied_{AxPart} de l'arbre.
the flowers grow at the foot of the tree
 'Flowers grow at the bottom of the tree' [i.e. on the soil around the tree]
- (47) a. Le moustique est collé sous le nez_N de la voiture.
the mosquito is stuck under the nose of the car
 'The mosquito is stuck under the front part of the car' [i.e. the bumper]
- b. Le chien a traversé sous le nez_{AxPart} de la voiture.
the dog has crossed under the nose of the car
 'The dog crossed the street right in front of the car' [i.e. the area right under the front of the car, and as a consequence the car almost hit it]

All the relevant contexts converge to suggest that relative spatial part terms are not Ns but instead AxParts. This means that French has AxParts as heads of DPs. It also suggests that the role of the (singular) definite article found (obligatorily) with relative spatial part terms is precisely that of a function that turns AxParts into (referential) DPs, and thus into argumental expressions.

As already mentioned, the definite article can easily combine with all sorts of categories in the absence of an overt N in French (see above); to the list given earlier, we can now add AxParts as well. Since the definite article can take AxParts in French, we expect to find other location terms with a relative interpretation in argumental uses beside spatial parts. As it turns

out, this is precisely the case. AxParts that are not homophonous with body parts can also appear as DPs. Location nouns like *côté* ‘side’ and *bas* ‘bottom’ can be either Ns or AxParts, in French (48)-(49). As AxParts, they can occur in argumental contexts as DPs. Compare, in particular, (48b) and (49b) with (6b) and (7b), above, respectively:

- (48) Le côté de la grange est en béton.
the side of the barn is in concrete
 a. N:
 the side wall is made of concrete.
 b. AxPart:
 the area of ground on the side of the barn is paved with concrete.
- (49) Le bas de la tour est couvert de mousse.
the bottom of the tower is covered of moss
 a. N:
 the bottom section of the tower is moss-covered.
 b. AxPart:
 the area of ground at the bottom of the tower is covered by moss.

Finally, to point out one property of AxParts that is not shared when occurring in DPs and when occurring in PPs, note that the former can be pronominalized (50), while the latter never allow pronominalization (51). This is, however, exactly what is expected since the location expression (e.g. *le dos de* ‘the back of’ in the pair below), which is an AxPart in both cases, occurs as a DP in (50), and therefore as any other referential expression, is pronominalizable; whereas it is a bare AxPart in (51) (which, being neither a referential expression nor a predicate, cannot be pronominalized in French):

- (50) DP(AxPart)
 Alors que le dos de la grange se réfléchissait dans le lac,
while that the back of the barn RFLX reflected in the lake
 celui de la ferme restait invisible.
the.one of the farmhouse remained invisible
 ‘While the back (area) of the barn was reflected on the lake, that [i.e. the back] of the farmhouse remained invisible’
- (51) AxPart-PP
 *L’orange pousse au dos de la grange et le
the.orange.tree grows at.the back of the barn and the
 citronnier à celui de la ferme.
lemon.tree at the.one of the farmhouse
 intended: ‘The orange tree grows in the back (area) of the barn, while the lemon tree grows in that [i.e. the back] of the farmhouse’.

Note that AxParts in PPs as in (51) contrast, as well, with fixed spatial part nouns in PPs, as in (52). This contrast is again expected, since fixed spatial part nouns are true nominals, and since in the context exemplified in (52) they are DPs complement of the prepositions *à* ‘at/in’ and *sur* ‘on’:

(52) Fixed spatial part Ns

- a. Paul attache un ruban au pied de l’arbre et toi à
Paul ties a ribbon at.the foot of the.tree and you at
celui de la statue.
the.one of the statue
 ‘Paul is tying a ribbon to the bottom of the tree, and you to that [i.e. the bottom] of the statue’
- b. Paul grave son nom sur le pied de l’arbre et toi sur
Paul engraves his name on the foot of the.tree and you on
celui de la statue.
the.one of the statue
 ‘Paul is engraving his name on the bottom of the tree and you onto that [i.e. the bottom] of the statue’

This means, however, that the definite article in (51), i.e. in complex PPs, is not the same as the definite article in (50) and in (52), as it does not serve, in the first case, to form DPs. The status of the definite article in complex PPs remains rather mysterious and I do not have anything more to add, except to point out again, and in support of the idea that they are different, that the definite article in complex PPs can, in many occurrences, be dropped in French, as in (53), while French does not have bare DPs at all:

- (53) *à côté de; à bord de; à travers de; etc.*
at side of at board of at traverse of
 ‘beside’ ‘on board’ ‘across’

I leave the issue of the status of the definite article in complex PPs open for further investigation.¹²

5. Conclusion

To conclude, the detailed study of body part nouns in French has shown that at least three types of expressions need to be distinguished: body part nouns (which can appear without their complement; e.g. *un pied* ‘a foot’), spatial part nouns (which always require their complement; e.g. *un pied de*

¹²In a very interesting way, the forms without an article often co-exist with variants with an article, with, at times, significant differences in meaning: *à travers de* (lit. at traverse of) ‘across’ vs. *au travers de* (lit. at the traverse of) ‘through’, *à bord de* (lit. at board of) ‘on board’ vs. *au bord de* (lit. at the board of) ‘at the edge/verge of’. I will leave this issue aside here.

table ‘a table leg’ (lit. a foot of table)), and spatial part AxParts (which exhibit the relevant properties of other AxParts not homophonous with body part nouns; e.g. *le pied de la tour* ‘the bottom area of the tower’ (lit. the foot of the tower)).

All of them have in common that they are inherently relational terms, however, by semantic criteria, as all necessarily have more than one argument. In the case of body part Ns, they denote a relationship between two arguments, *x* and *y*, where *x* is the *body part* of *y*; similarly, for spatial part Ns, where *x* is a *spatial part* of *y* and for AxParts, where *x* is a *projected space* of *y*.

In addition to the many semantic sub-divisions commonly accepted among relational nouns (kinship, e.g. *son*, *father*, body parts, e.g. *foot*, *arm*, measure, e.g. *kilo*, *bunch*, etc.) we can add one more: *spatial locations*. The spatial part expressions studied here are examples of them, as are nouns like *edge*, *top*, *summit*, *coastline*, *border*, etc., which all express part-whole relationships. Note that this property does not differentiate part nouns from other relational nouns according to Barker and Dowty (1992), who argue that all relational nouns express, in actuality, Proto-Part and Proto-Whole relationships.

Finally, we have seen that in French AxParts can occur as heads of DPs in argumental positions. This means that AxParts are not restricted to occurring in PPs only, as one might think in the light of languages like English, for instance, where AxParts are (to the best of my knowledge) not permitted as DPs. In fact, if it is true that the two languages differ in this way, the difference should be placed, I have suggested, at the level of the article, and the possibilities in the language for the article to combine with other categories than NPs (or alternatively with null nouns modified by adjectives, PPs, etc.), rather than as an intrinsic property of AxParts. The validity of this claim would need to be further investigated cross-linguistically and is left open for further research.

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